Ministry of
Northern Development
and Mines

Ontario

Mines and Minerals Division
Ontario Geological Survey

Open File Map 199

Quaternary Geology

Dog Lake Area

Northern Ontario

Scale 1:50 000

1000 m 0 1 2 km

UNEDITED MANUSCRIPT

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Morris, T.F. 1992. Quaternary geology, Dog Lake area, northern Ontario; Ontario Geological Survey, Open File Map 199, scale 1:50 000.

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MARGINAL NOTES

INTRODUCTION

Quaternary geology mapping of the area defined by the northern half of the Manitowik Lake map sheet (NTS 42 C/1) and the southern half of the Franz map sheet (NTS 42 C/8) was completed during the summer of 1991. This 1:50 000 scale mapping provides basic data for environmental studies, land use planning, drift prospecting and aggregate potential evaluation.

Mapping involved the examination of road, river cut and lake bluff exposures. Auguring and digging of test pits provided additional information. Highway 651 and the Canadian Pacific Railway line provided access to the eastern part of the map area. Newly constructed and abandoned forestry and mining roads provided access to the northwestern and west central parts of the study area. Boat access through the central and southwest parts of the map area was provided by Manitowik, Dog and Wabatongushi lakes. Mapping was aided by 1:15 840 and 1:63 360 scale black and white aerial photographs, as well as radar and Landsat imagery.

Reconnaissance scale mapping of the surficial geology, including the mapping area, was completed by Boissonneau (1965). Gartner and McQuay (1979) have completed an engineering and terrain study in the Wawa area. The distribution and characteristics of Quaternary deposits over a small area east of Goudreau were defined by Finley (1989).

BEDROCK GEOLOGY

Detailed bedrock studies which cover parts of the map area include those by Bruce (1940), Downes (1983), Riley (1971), Sage (1983, 1984, 1985, 1987) and Srivastava and Bennett (1978). Studies on gold mineralization in the area were completed by Arias and Heather (1987), Heather and Arias (1987) and Heather and Buck (1988).

The study area is largely underlain by the Michipicoten Greenstone Belt which extends about 150 km east northeast from the shore of Lake Superior. This belt contains Archean supracrustal rocks of the Wawa Subprovince of the Superior Province (Sage and Heather 1992). Intermediate mafic volcanic rock makes-up the majority of the greenstone belt. Bands, or belts, of intermediate felsic metavolcanic rocks, clastic metasedimentary rocks and, to a lesser extent, chemical metasedimentary rocks are also present. Several felsic intrusive bodies (stocks) are exposed at the surface within the supracrustal rocks (Arias and Heather 1987). The remainder of the map area consists of large felsic intrusive bodies that surround the greenstone belt.

QUATERNARY GEOLOGY

All Quaternary deposits within the map area are likely Late Wisconsinan or younger in age. Ice flow direction indicators are preserved in the form of striations, glacial grooves, chatter marks and ice-moulded bedrock forms. Striae orientations indicate a regional southwestward flow centred on (220°). Slight deviation from this regional flow occurs in the southeastern part of the study area by Matchinameigus Lake where flow was toward 200°.

As ice retreated from the study area recessional moraines, eskers and a substantial amount of outwash were deposited. Large deposits of glaciolacustrine sediments are found within bedrock basins where glacial meltwater was impounded between the receding ice margin and bedrock highlands to the south.

Almost two-thirds of the surface of the map area consists of bedrock; either exposed at the surface (Map Unit 1) or overlain by a veneer of thin till (Map Unit 1a) or outwash (Map Unit 1b).

TILL

The thin till veneer (Map Unit 1a) has a sandy to sandy silt matrix. This till type is compact, massive and was deposited by lodgement processes. The incorporation, transportation and deposition of debris occurred at the base of the ice and therefore clast lithologies are predominantly of local origin.

The thicker till (Map Unit 2) associated with recessional moraines is more variable in matrix texture (silty sand to sandy silt with rare lenses of clayey silt). This till type is compact and consists of debris flow lenses. Debris transport occurred in the basal, englacial and supraglacial positions in the ice sheet. Clast lithologies are derived from both local and distal sources.

ICE-CONTACT STRATIFIED DRIFT

Glaciofluvial ice-contact stratified drift (Map Unit 3) consists largely of sand and gravel found within eskers. Most of the large eskers within the study area are located between Goudreau and Localsh and north of Dog Lake. Several smaller eskers are found

scattered throughout the eastern part of the map area. All eskers are flanked by glaciofluvial outwash or are partially buried by glaciolacustrine sand.

GLACIOFLUVIAL OUTWASH

Glaciofluvial outwash deposits (Map Unit 4) consist predominantly of gravel and sand. Much of the outwash is restricted to a number of narrow meltwater channels which either extend from former stable ice margin positions or exit from ice-contact lakes. A broad northeast trending belt of outwash exists between Goudreau and Localsh. Within this belt, the thickness of outwash is controlled by bedrock topography. Thin outwash (<1 m thick) is present over bedrock ridges while thicker outwash deposits (>1 m thick) occur within bedrock depressions.

GLACIOLACUSTRINE DEPOSITS

Glaciolacustrine deposits (Map Unit 5) consist of very fine to medium sand and varved silt and clay. The sand (Map Unit 5a) was deposited in glacial lakes impounded between the ice sheet and bedrock highlands. Such deposits occur around the railway sidings at Dalton and Localsh and in the Fletcher, Dog and Manitowik lake areas.

Varved silt and clay (Map Unit 5b) were deposited in a deep water environment which formally occupied the Dog and Manitowik lake basins. Varved silt and clay can be observed along the shores of Dingman Bay, and at two unnamed bays on the shore of Manitowik Lake; one on the northwest and the second on the southeast. Varved

silt and clay are also preseent along the south shore of Localsh Bay in Dog Lake, however, this deposit is buried below modern beach sand.

RECENT DEPOSITS

Eolian deposits (Map Unit 6) consist of fine sand and are located within several small dune fields. The sand which comprises the eolian deposits was derived from the belt of glaciofluvial outwash sand and gravel located between Goudreau and Localsh. Dunes are of the parabolic-type and their orientation indicates a paleowind direction toward the northeast.

Modern alluvium (Map Unit 7) consists of sand and gravel and minor amounts of silt. Modern alluvium occurs as bars and overbank deposits along the courses of modern rivers and streams. Minor fans of modern alluvium exist where rivers or streams exit confined bedrock valleys.

Swamp and organic deposits (Map Unit 8) consist of saturated organic matter deposited as muck and thins beds of peat. This material is restricted to poorly drained depressions which are common throughout the area. Man-emplaced deposits (Map Unit 9) are of restricted occurrance and consist of mine tailing ponds and waste rock and wood chips from saw mills.

APPLIED QUATERNARY GEOLOGY

Historically, aggregate within the study area has been utilized in a variety of engineering and construction applications. These included road construction, fill and the manufacture of asphalt,

concrete and concrete products (Bill Lamon, pers. comm., Michipicoten Township, 1992). Aggregate reserves are sufficient for local demand for the foreseeable future. Aggregate operations within the map area are active on an on demand basis.

Drift prospecting, particularly methods involving the use of till sampling, may be useful in evaluating economic mineral potential of tthe area. In addition, pebble lithology and precious metal content evaluation of glaciofluvial deposits (Map Units 3, 4, 5a) could assist in determining: 1) the placer gold potential of these deposits; and 2) the potential of these deposits as a prospecting tool for bedrock sources of precious metals.

REFERENCES

Arias, Z.G. and Heather, K.B. 1987. Regional structural geology related to gold mineralization in the Goudreau-Localsh area, District of Algoma; in Summary of Field Work and Other Activities 1987, Ontario Geological Survey, Miscellaneous Paper 137, p.146-154.

Boissonneau, A.N. 1965. Algoma, Sudbury, Tamiskaming, and Nipissing Surficial Geology; Ontario Department of Lands and Forests, Map S465.

Bruce, E.L. 1940. Geology of the Goudreau-Localsh area, District of Algoma; Ontario department of Mines, Annual Report, v.49, pt.3, p.1-50.

Downes, M.J. 1983. Geology of the Matchinameigus Lake area, District of Algoma; Ontario Geological Survey, Report 233, 40p.

Finley, W.D. 1989. The Quaternary Geology of Jacobson Township, Goudreau-Localsh Region, District of Algoma, Ontario; unpublished B.Sc. Thesis, Carleton University, Ontario, 92p.

Gartner, J.F. and McQuay, D.F. 1979. Goudreau area (NTS 42 C/SE), District of Algoma; Ontario Geological Survey, Northern Ontario Engineering Geology Terrain Study 73, 14p.

Heather, K.B. and Arias , Z.G. 1987. Geological setting of gold mineralization in the Goudreau-Localsh area, District of Algoma; in Summary of Field Work and Other Activities 1987, Ontario Geological Survey, Miscellaneous Paper 137, p.155-162.

Heather, K.B. and Buck,S. 1988. The geological and structural setting of gold mineralization in the Missinaibi-Renabie district of the Michipicoten greenstone belt, Wawa, Ontario; in Summary of Field Work and Other Activities 1988, Ontario Geological Survey, Miscellaneous Paper 141, p.257-270.

Riley, R.A. 1971. Geology of Glasgow, Meath and Rennie townships, districts of Algoma and Sudbury; Ontario Department of Mines and Northern Affairs, Geological Report 90, 55p.

Sage, R.P. 1983. Josephine area, District of Algoma; in Summary of Field Work and Other Activities 1983, Ontario Geological Survey, Miscellaneous Paper 116, p.45-49.

-----1984. Josephine-Goudreau area, District of Algoma; in Summary of Field Work 1984, Ontario Geological Survey, Miscellaneous Paper 119, p.56-61.

-----1985. Goudreau-Localsh area, District of Algoma; in Summary of Field Work and Other Activities 1985, Ontario Geological Survey, Miscellaneous Paper 126, p.90-94.

-----1987. Geology of Goudreau-Localsh and Kabenung lake areas, District of Algoma; in Summary of Field Work and Other Activities 1987, Ontario Geological Survey, Miscellaneous Paper 137, p.134-137.

Sage, R.P. and Heather, K.P. 1992. The structure, stratigraphy and mineral deposits of the Wawa area: Geological Association of Canada, Mineralogical Association of Canada, Society of Economic Geologists, Joint Annual Meeting, Toronto '91, Field Trip A6: Guidebook, 118p.

Srivastava, P. and Bennett, G. 1978. Geology of Riggs and West townships, District of Algoma; Ontario Geological Survey, Report 174, 56p.

Quaternary Geology Of The Dog Lake Area
Open File Map
Legend

Phanerozoic

Cenozoic

Quaternary

Recent

9 Man emplaced deposits: mine tailings and waste rock, wood chips.

8 Swamp and Organic deposits: peat and muck.

7 Modern alluvium: coarse, medium and fine sand.

6 Eolian: fine sand.

Pleistocene

5 Glaciolacustrine deposits.

5a very fine, fine and medium sand.
5b varved clay and silt.

4 Glaciofluvial outwash: sand and gravel.

3 Glaciofluvial ice-contact stratified drift: sand, gravel and boulders.

2 Till: sandy to sandy silt with rare clayey silt lenses.

Precambrian

1 Bedrock.

1a discontinuous thin till cover.

1b discontinuous thin glaciofluvial cover.

Symbols

Geological Boundary (approximate).

Glacial striae: direction of ice movement known or assumed; dot represents actual site location.

 Small bedrock outcrop

Beach Ridge

Esker ridge: direction of flow known or assumed.

Ice contact slope.

Kettle depression.

Trend of moraine crest.

Fluvial terrace escarpment.

Direction of former glaciofluvial meltwater flow: direction of flow known or assumed.

Sand or gravel pit (active or abandoned)

Mine (active or abandoned)

SOURCES OF INFORMATION

Basemaps derived from Maps 42 C/1 (Manitowik Lake) and 42 C/8 (Franz) of the National Topographic System. Contour interval 50 feet, scale 1:50 000.

Aerial photography by the Ontario Ministry of Natural Resources, Toronto.

Magnetic declination approximately 7° 16′ in 1979.

CREDITS

Geology by T.F. Morris and assistant, 1991.

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Northern Development and Mines does not assume any liability for errors that may occur. Users may wish to verify critical information.

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